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# CRITICAL THINKING AND ACADEMIC SUCCESS OF ENGLISH LANGUAGE STUDENTS

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**Abstract:**

The goal of this study is to examine the relationship between critical thinking skills and academic achievement of English language learners in relation to different personal and environmental factors. In total, 117 female and 54 male (N=171) English language and literature students (age of M=20.99, SD=2.43) from four different universities in Bosnia and Herzegovina participated. Critical thinking skills and socio-demographic characteristics were examined by Ennis-Weir Critical Thinking Essay Test (EWCT) and Demographic Data Questionnaire. Nonparametric statistical procedures were used to test relations of critical thinking skills and academic achievement (GPA) clustering for gender, age, family education level, university affiliation and year of study. Analysis indicated only one significant relation between the socio-demographic variables, EWCT and GPA scores: very weak negative correlation between age and GPA ($r_s$=-.160, $p$<.05), with a small effect size, accounting for 2.56% common variance. A statistically significant positive moderate correlation ($r_s$=.41, p<.001) with medium effect size (16.81% variance) between EWCT and GPA was found. Furthermore, difference between EWCT mean rank scores by GPA grade levels was a statistically significant: $\chi 2(4)=35.751$, p<.001. According to these results, critical thinking skills are important for students' academic achievement. Forthcoming research needs more clarification of socio-demographic, environmental factors and critical thinking skills relationship.

**Key words:** academic achievement, critical thinking, English language learners, tertiary education

## INTRODUCTION

New millennium educational researchers promote the importance of a final drift from the concept of mere memorization and repetition of the content in education. As a solution, higher order thinking skills are promoted. Post-war, transitional Bosnian society is faced with on-going political problems which affect education in a negative way. Reforms of education have put burdens on all parties of the educational process. Simultaneously, teachers must balance the demands of new and reformed schooling system, constant curriculum changes and limited time frames, within the 21st century demands for high-order thinking skills (such as creativity and critical thinking). Etymologically, the term "critical" has its roots in the Greek language. The meaning of the Greek word kritikos is the ability to judge, decide, and discern. One of the first modern critical thinking theorists, John Dewey, described critical thinking as an "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends" (1910, p. 2). According to Paul (1995), the ability to think critically is absolutely imperative for students

who are to become participants in tomorrow's society. The ability to think critically has to do with the disposition for a person to consider multiple perspectives, anticipate opposing viewpoints, validate cross-cultural differences, and to make dialectic decisions. Thinking critically, as an important and complex cognitive skill, should be understood as thinkers' second nature – however, it is not (Smith, 2009). Humans are driven to think on a higher level, which could be thought of as the expected way of operating. The question is, can we direct the brain to reach higher levels of thinking through education? Is that aim too demanding for educationalists? Humans are driven to think on a higher level. Teachers' instructions which support higher order thinking skills through all levels of education can result in increased competencies of students. Those competencies will equip future workers for real life challenges and effective engagement in all spheres of human activity. Florea and Hurjui (2015) explained that critical thinking has been positioned as a process, and as well as a product in relation to language. This is close to the theory of Vygotsky, which emphasizes the mutual relationship of these two mental concepts. As language acquisition processes engage learners' high-order thinking skills in order to negotiate the meaning, at the same time, better language skills and active language use activate critical thinking skills. In their intention to adopt new words and linguistic rules from a foreign language, learners automatically engage their high-order thinking skills, as they aim to understand the meaning of new language concepts, as well as, make logical correlations of those new language concepts, with already familiar ones. Sternbergs' tribrachic theory of intelligence (1986) includes analytic thinking skills, creative thinking skills, and practical thinking skills. According to Sternberg, in the school environment, analytical thinking skills (analyzing, critiquing, judging, evaluating, comparing and contrasting, and assessing) are most frequently promoted and assessed. On the other hand, creative thinking skills (inventing, imagining, creating, discovering, supposing, and hypothesizing) and practical thinking skills (using, applying, and practicing the other thinking skills) are less promoted. As categorized above, analytical skills can be interpreted as a synonym for the concept of critical thinking.

Critical thinking is considered as a process of thinking about thinking. This requires a great mental effort. Complex human minds have to make a lot of endeavour of this kind be able to answer the many questions that turn out to be preventing for the accomplishment of the final point or getting an idea ("the eureka moment"). In this, peculiar case, that is the moment of final grasp of the new linguistic concepts. The eureka moment is what has been for centuries enriching human civilization and made us proud of the many wonders of human creation. And it all started from a critical observation of the world around us. This is where critical thinking pedagogy finds its applicability and importance in foreign language teaching.

Here we notice an active role of students who do not adopt a passive knowledge than is engaged and monitor his/her own achievement. Therefore, student who thinks critically has not a problem with his/her intrinsic motivation because language learning has a greater value for him (countless studies indicate the importance of intrinsic motivation in a foreign language acquisition). The research shows that "99% of college faculty say that developing students' critical thinking skills is 'very important' or essential" (Arum and Roksa, 2011, p. 35). Extraordinarily high percentage of university professors who supported the claim that teaching critical thinking skills is of great importance gives us a clear indication that for the improvement of the quality of higher education we need a certain change or reform to turn more to a logical reasoning and divergent thinking of our students. We may say that we need a great paradigm switch in education in general. Also, due to such a high percentage of teachers who claim that critical thinking is necessary in the tertiary education classroom, proves us that critical thinking does not exist sufficiently. In the study of Rodzalan and Saat (2015) undergraduate students' perception of critical thinking and problem solving was measured. Two thousand Malaysian public university students perceived that they possess high level of critical thinking and problem-solving skills. Male students perceived to have higher level of these skills. In the critical thinking theory, we have found that many theorists asked whether critical thinking is teachable

concept only in philosophy or logic courses, or it could be taught across the whole curriculum in all other courses? According to McCollister and Sayler (2010) critical thinking is possible to infuse in all courses throughout curriculum. A suggested method for this is engaging inquiry method and teaching students to critically evaluate every information, data as well as sources. Rafi (2011) stated that there are three main reasons why we need to promote critical thinking skills development in the second language classroom to help students to make language improvement. First reason is that if language learners can take charge of their thinking processes, they can guide and evaluate well their language learning process. The second reason is that "critical thinking expands the learning experience of the learners and makes the language more meaningful for them" The last, third reason is that the level of *critical thinking skills is highly correlated with achievement* of the learner.

The theoretical framework for this research study is based on the conception of critical thinking provided by Robert Ennis. Ennis defines critical thinking as "reasonable and reflective thinking focused on deciding what to believe or do" (1991, p.6). In this definition, two very important aspects are successfully incorporated in order to support a multidimensional aspect of critical thinking - the act of believing and doing. The former component employs the cognitive aspect of the human mind and is considered a disposition, while the latter addresses conative dimensions of the human mind and could be related to the critical thinking ability dimensions. In his approach to critical thinking Ennis highlights that in deciding what to believe or do, we have to have both the disposition and the ability for critical thinking. If we further analyze the mentioned set, it may be deduced that critical thinkers should be equipped with both inherent predispositions and acquired abilities. The latter one is reserved for parents, schools, teachers, curriculum developers, and the society as a whole, whose task is to create a positive and supportive climate for the development of critical thinking skills. In the era we live in, an exceptionally important aspect we have to reconsider is the possibility that our ideas, beliefs, and thoughts are implemented in practice. The spirit of the postmodern era requires full engagement in terms of carrying out thoughts in the area of acting and doing. After all, the ultimate goal of all forms of education and learning is to implement the acquired knowledge in real-life contexts (regardless of whether it is spiritual, conative, social, or any other form of progress). Ennis (1991) points out that the proposed definition does not eliminate the act of creative thinking. In this sense, formulating hypothesis, questioning, planning, and looking for solutions, is an essential part of the proposed definition. At the same time, the definition implies a rational dimension of critical thinking (reasonableness and decision making). Additionally, as Ennis further explains, critical thinking is a crucial component of the process of problem solving (p. 6.). While trying to employ critical thinking in education (particularly language education), we rely on both creative and rational dimensions of critical thinking.

## RESEARCH QUESTIONS AND HYPOTHESES

The main goal of this study is to examine the relationship between critical thinking skills and the academic achievement of foreign language learners in relation to different personal factors, as well as factors pertaining to tertiary education teaching methodologies. We primarily intended to provide a wider overview and analysis of possible relationships, rather than test exact causal models and causal relationships. We are interested in the following:

1. Is there a relationship between critical thinking skills and academic achievement of foreign language students? If there is, what is the nature of this connection? In other words, what does this relationship mean and how can it be interpreted in a wider context of relationships with, theoretically and empirically, more significant personal and environmental factors (variables). These include:

1.1. socio-demographic characteristics of the respondents (gender, age, educational level of parents, affiliation with the university, year of study);

1.2. personality characteristics, specifically, the critical thinking skills disposition, as an essential component of successful intellectual functioning.

Based on the previously defined aim of the study and research questions, we formulated the main Hypotheses (H) and two derived hypotheses (subhypotheses):

*H*: There is a statistically significant relationship between critical thinking skills and academic achievement of foreign language learners in tertiary education.

*H*1: There are differences in the measures of critical thinking skills (here dependent variable) and academic achievement in terms of gender, the age of students, the educational level of parents, university affiliation and year of study (independent variable);

*H*2: Better academic achievement (expressed in GPA, here dependent variable) is achieved by students who have higher level critical thinking skills (expressed by Ennis-Weir Critical Thinking Test Results, independent variable).

# Method

## Participants

In total, 117 female and 54 male students (N=171) ages of M=20.99 (SD=2.43) were examined. This study samples nearly the entire population of the second, third and fourth year English language and Literature Department students at four different universities in Bosnia and Herzegovina, out of which, three public universities: University in Sarajevo (UNSA), University in Tuzla (UNTZ), University in Zenica (UNZE) and International Burch University (IBU) as a private university. All four universities are among top five the best ranked universities in Bosnia and Herzegovina.

## Measures

1. The Ennis-Weir Critical Thinking Essay Test (Ennis & Weir, 1985) (EWCT), with written approval from the author, has been used. Based on the previous results (Ennis, 2005), EWCT showed acceptable content validity, inter-rater and Cronbach alfa reliability. Ennis and Weir (1985) reported inter-rater reliability coefficients of .86 and .82. This is an open ended, general critical thinking ability test focused on the argumentation. The participants' task is to read and evaluate arguments, as well as, respond trough the complex argumentation to those arguments. In a 40-minute testing procedure, students had to read a fictitious letter to an imaginary editor of the local newspaper where a proposal to ban overnight parking on the city streets of Moorburg is offered. There are eight numbered paragraphs which support suggested parking prohibition. There are a few errors in reasoning, found in each of the eight paragraphs. At the same time, the students' task is to notice if the author suggested valid arguments, and they should explain why they find a certain reason as justified. Reasoning errors in the letter include equivocation, circular reasoning, credibility problems, overgeneralization, and reversal of if-then relationships, as well as, use of emotive language to persuade. Also, students should see the reasons and assumptions, state one's point and get the point, offer good reasons, see other possibilities and respond appropriately. Students are required to write nine paragraphs (eight as a response to each numbered paragraph, and the overall ninth paragraph in which they summarize everything they had said before). It is explained that this critical thinking essay test "is not a test of formal or deductive argument, nor does it require technical knowledge of such"

(Ennis, 2005). The great advantage of EWCT is that it engages in reading and writing, an open-ended test that encourages tertiary education students to express their high-order thinking skills, to provide argumentation for their ideas, to challenge the opposite side by the power of their arguments and to be in the position of a certain authority who is invited to provide counter-argument. In this sense, we get better insight at our students' level of critical thinking skills, than by using multiple-choice instruments which are limited on reading. First eight paragraphs the EWCT are graded on a scale of -1 to +3. The last, ninth, summarization paragraph is scored minimum -1 points and maximum +5 points. Thus, total scores can range from -9 to 29. Table 1. displays subscales of the EWCT test, evaluated in each of the nine paragraphs. As explained in provided test manual (Ennis, 2005), EWCT is a test of the critical thinking ability, not writing ability.

Table 1. Subscales of EWCT: description and scoring (Ennis and Weir, 1985)

| Number of Paragraph | Subscale of the Ennis-Weir Critical Thinking Essay Test | Number of points |
|---|---|---|
| 1st Paragraph | An ability to recognize misuse of analogy, an ability to evaluate an argument, an ability to distinguish between strong and weak arguments | -1 to +3 |
| 2nd Paragraph | An ability to evaluate an argument, an ability to distinguish between strong and weak arguments | -1 to +3 |
| 3rd Paragraph | An ability to perform deduction skill | -1 to +3 |
| 4th Paragraph | An ability to make inferences | -1 to +3 |
| 5th Paragraph | An ability to evaluate an argument, an ability to distinguish between strong and weak arguments | -1 to +3 |
| 6th Paragraph | An ability to recognize an assumption | -1 to +3 |
| 7th Paragraph | Penchant for interpretation | -1 to +3 |
| 8th Paragraph | An ability to perform deduction skill | -1 to +3 |
| 9th Paragraph | Summarization of the content | -1 to +5 |
| | | Max: +29<br>Min: -9 |

Ennis, (2005) suggested contextualizing the test validity. In our research, very high reliability coefficients has been achieved:Cronbach alfa (α) = .97 and Intraclass Correlation (ICC) = .98.

2. Demographic Data Questionnaire (DDQ) were designed by researcher in order to collect data regarding students' demographic characteristics, including age, gender, citizenship, father's and mother's education level, year of study, and the overall grade point average (GPA).

## Procedure

As a part of a broader study, this research took place over the course of the fall semester (2016/2017 academic year). By following the American Psychological Association (APA) research standards, all the students participating in the study have signed a consent forms confirming that their participation in this project is voluntary and that all the data gathered is confidential. Also, participants singed that they may withdraw and discontinue participation at any time without penalty. In a 40-minute testing procedure, students completed EWCT followed by DDQ. In addition to other pieces of demographic data, we also collected data about students' grade point average (GPA) scores. The term 'academic achievement' that we use in this

research refers to the overall average of students' grades in all previous semesters. The process of collecting information about students' GPA was fairly complex and sensitive. Through the questionnaire, we asked all the sampled students about their GPA. In addition, we tried to receive and verify this information with the Heads of Student Affairs offices and relevant academic staff. In the case of the University of Zenica and International Burch University, the Heads of the Student Affairs Office provided the necessary answers, while at the University of Sarajevo this was done by a member of the academic staff. The Head of the Student Affairs Office at the Faculty of Philosophy at the University of Tuzla could not provide the additional information (due to regulations concerning the protection of personal data of students), and we conducted an additional review of the data by re-contacting all the students from the sample and asking them to contact the Student Affairs Office and receive information about their GPA in person. This process lasted for months.

# Results

Prior to hypothesis testing we conducted the preliminary statistical analyses. The analysis of descriptive data for the Critical Thinking variable and Academic Achievement (Table 2) with exact normality Kolmogorov-Smirnov (K-S) statistical test indicated statistically significant deviations from the normal distribution. Therefore, nonparametric statistical procedures were applied to test the hypotheses.

Table 2. EWCT Test Scores and GPA descriptive statistics

| Variables | N | M | SD | Skewness | Kurtosis | K-S | *p* |
|---|---|---|---|---|---|---|---|
| Critical Thinking | 171 | 8.63 | 5.92 | .68 | -.14 | .09 | .001 |
| GPA | 171 | 7.74 | .96 | .56 | -.37 | .13 | .000 |

## Socio-demographic characteristics, critical thinking and academic achievement

According to our H1 hypothesis, we conducted a Mann-Whitney U test, Kruskal-Wallis Test and Spearman's correlation ($r_s$) test to find out if there are any relation in the measures of critical thinking skills (represented by EWCT test scores), academic achievement (represented by GPA scores) and gender, the age of students, the educational level of parents, university affiliation and year of study. Only one significant relation was found: the Spearman's rho test showed very weak negative correlation between age and GPA scores ($r_s$ = -.160, $p$ < .05), and a small effect size (Cohen, 1988), accounting for 2.56 % common variance. Exact statistical tests of the relationship between variables of critical thinking, academic achievement and socio-demographic variables were not significant in the sense and to the extent that could affect the further analysis of the relationship between critical thinking and academic achievement.

## The Relationship between Critical Thinking and Academic Achievement

To test our H2 hypothesis, we calculated Spearman's rho correlation coefficient for scores of the EWCT test and GPA revealing a statistically significant positive moderate correlation between the variables ($r_s$= .41, p < .001), The effect size of this relationship was medium (Cohen, 1988). Squaring the correlation coefficients indicated that 16.81 % of the variance in the student's GPA scores was explained by the EWCT. Similarly, 16.81.% of the variance in the EWCT was explained by the GPA scores of students. Moreover, the Independent-Samples Kruskal-Wallis Test was conducted in order to analyze differences in EWCT scores clustered according to GPA based on Bosnia and Herzegovina grading levels, beginning from grade 6 (very low, but acceptable academic achievement) to 10 (the highest, excellent academic achieve-

ment). The test results indicate a statistically significant difference between EWCT mean rank scores by GPA grade levels ( $\chi 2$ (4) = 35.751, $p < .001$) with a mean rank of 21.06 (for grade 6), 77.03 (7), 80.83 (8), 117.96 (9) and 124.11 (10). The Figure 1. presented below illustrates that the critical thinking skills level measured by EWCT increases with the students' grades.

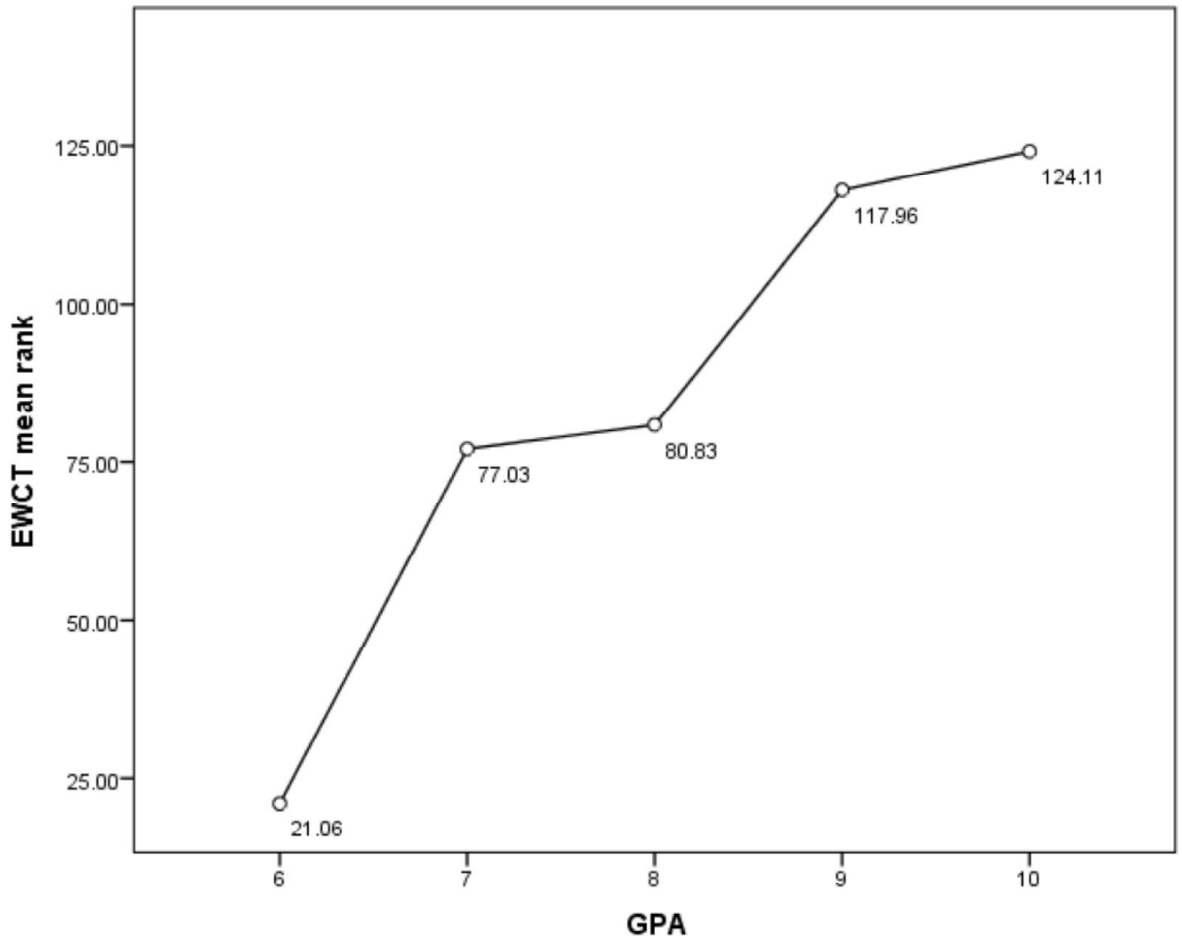


Figure 1. EWCT and GPA relation

Thus, findings revealed herein were supportive for our second hypothesis about significant, positive relationship between critical thinking and academic achievement of university students.

# Discussion

In this study, we examined the interconnection between the levels of critical thinking skills and academic achievement in the foreign language teaching context based upon critical thinking conception developed by Ennis (1991). This theory assumes that critical thinkers possess a set of reasonable and reflective cognitive capacities that provide genuine guidance in making decisions about beliefs and actions. In our research it is hypothesized that the aforementioned cognitive capacities of critical thinkers will result in better academic success.

## The EWCT validity and reliability

As we previously mentioned, Ennis, (2005) suggested contextualizing the test validity, that is, "focus on the extent to which in the situation the test assesses what it is supposed to assess. This works conceptually for test users because that is what they are really interested in" (p. 1). Reliability indicators provided by Ennis (2005) are presented in the table 2.

**Table 2.** Obtained reliability indicators for the EWCT (Ennis, 2005)

| Level | N | Reliability | Type |
|---|---|---|---|
| College | 27 | .86 | Inter-rater |
| 8th grade gifted | 28 | .82 | Inter-rater |
| 8th grade "above average" | 93 | .97 | Inter-rater |
| 5th and 6th grade | 49 | .58 pre; .61 post | Inter-rater |
| College | 187 | .59 | Cronbach alpha |
| College, English Second Language | 60 | .91 pre; .92 post | Inter-rater |
| College | 29 | .92 | Same rater, 4 months stability |
| High school | 172 | .72 | Cronbach alpha |
| College | 25 | .90 | Inter-rater |
| College, English Second Language | 36 | .72 | Inter-rater |
| College | 101 | .93 | Inter-rater |
| College | 48 | .74 | Inter-rater |
| College | 52 | .98 pre, .99 post | Inter-rater |

In sum, EWCT in different studies showed high (different types) of reliability coefficients, ranging from .59 to .99. Our results are in the line of these findings, with the highest Cronbach alfa and Intraclass correlation coefficients ($\alpha$ = .97., ICC = .98).

## Critical thinking and academic achievement in the light of socio-demographic factors

We examined if the relationship between critical thinking skills and academic achievement exists in a wider context of relationships with different socio-demographic characteristics of the respondents (gender, age, educational level of parents, affiliation with the university, and the year of study). Each of the five socio-demographic categories will be discussed separately, after which a general conclusion for the first research question will be derived.

### *Gender*

We found a lack of statistically significant differences for EWCT as well as GPA by gender. Similar findings were reported in the study of Salashoor and Rafiee (2016). The results demonstrated that gender did not have an impact on measures of critical thinking (CT) skills. In the study conducted by the Program for International Student Assessment and the Organization for Economic Cooperation and Development (2009) it was revealed that gender differences in problem solving skills were minor and statistically insignificant. Gender was the second independent variable in the study of Afsahi and Afghari (2017), where the relationship between measures of critical thinking was also insignificant. This is in line with findings of Kolayiş at al. (2014) and the study of Rodzalan and Saat (2015). As demonstrated in several different studies,

the results are mixed and do not give a clear indication of possible gender differences in the context of critical thinking skills. The interplay of nature and nurture factors influences critical thinking skills manifestation; depending on the contexts, men and women performed differently on the CT tests.

### *Age*

The perception that mature students are profound thinkers, compared to their younger colleagues, has long been under investigation. The main idea is that over years of new interactions and experiences, the human brain becomes enriched with valuable educational content and thus acquires skills of thinking at higher levels. In our study, the examined relationship between EWCT test scores and age was not statistically significant. However, the results of the GPA scores related to age have revealed very weak negative correlation. The study of Afsahi and Afghari (2017) supported our findings concerning the lack of statistically significant correlations between critical thinking measures and age. In the study of Denney (2007), the relationship between age and measures of critical thinking was indicated in that mature participants had lower scores on critical thinking tests. Momanyi at al. (2015) proved that mature students have lower academic achievement scores than younger ones. Rumberger (1995) did not find any relation between the two variables. As is the case with gender differences, the results of different studies examining the influence of age on the tested variables are different and very often controversial. The reason could be found in the wide variety of factors that could be taken into consideration. For educationalist, these results are encouraging because they indicate that, regardless of the context, with quality education and infusion of critical thinking skills, high academic achievements will be accomplished.

### *Parents' Education Level*

Family background has been considered as one of the most important factors for students' academic success (Coleman at al., 1966; Jencks et al., 1972, as cited by Rumberg 1995). Parents' education level could be a prevailing factor for students' critical thinking skills, as critical thinking is a concept that belongs to social learning practices (Brookfield, 2011). In our research, we found the lack of statistically significant difference between the EWCT test scores and GPA scores in relation to parents' education level. The study by Günaydın and Barlas (2015) presents similar findings. Parents' education level was not in correlation with the level of critical thinking skills of tested students. To our best knowledge, there are not many studies that focus on the relationship between critical thinking and parents' education levels. If the education system promotes critical thinking skills, then it would be expected that parents' education levels are related to the level of critical thinking skills of sampled students. The reason for the low correlation between CT skills of our students and their parents' education level could be ascribed to the poor promotion of critical thinking as a core value across school systems. Moreover, the idea that in contemporary society family has lost its traditional function, previously existent for centuries (Pašalić-Kreso, 2009) could be understood in the context of the lack of connection between students' critical thinking skills level and parents' education level. If raised in warm family environment with sufficiently positive parents' interactions, then students would have a chance to learn skills of CT from their parents. Additional possible reason for the lack of statistically significant difference between EWCT and GPA scores in relation to education level of parents could be a product of measurement errors.

### *University Affiliation*

Our research has revealed a lack of statistically significant differences in the measures of critical thinking among groups of students from different universities. According to Dunne

(2015), universities should educate students who are active and responsible in finding ways to understand reality and upgrade their thinking (p. 89). On the contrary, information which comes from practice often demonstrates the opposite (Dunne, 2015; Pašalić-Kreso, 2009; Slatina, 2005). When it comes to thinking and problem-solving skills, students very often come unprepared for the labor market. This is mainly because the educational environment does not promote the necessary skills through content-based instruction. Parslow (2002) supports this assumption reporting that "critical thinkers tend to be born, not created "and further explains this by the fact that CT tests performed on students before and after university education revealed no statistically significant improvement in terms of critical thinking skills (p. 65). A clarification for the lack of differences between different universities could be found in the fact that all four departments do not systematically promote critical thinking, which is obvious from the curriculum (the lack of general courses on critical thinking), as well as from the qualitative analysis of students' interviews. Furthermore, although the Bologna reform holds critical thinking as one of the most important aims of education, at the same time it presents an orientation toward manipulating knowledge and assessment in line with the needs of the market and the economic competition, which does not leave enough space for core values of education, such as critical thinking skills development (Gojkov at al., 2015). It should be noted that the four sampled ELL Departments have different curricula with some overlapping courses, while some differ considerably. The International Burch University ELL Department uses English as the language of instruction, while in the other three English Departments (Sarajevo, Zenica and Tuzla), the language of instruction depends on the instructor (in some courses English language is in use, and in some courses Bosnian/Croatian/Serbian language is the language of instruction). By examining the curriculum content, we realized that not one of the four sampled departments offer a general course in critical thinking, which could be the reason for the overall low achievement of undergraduate students on the Ennis-Weir test. The generally low-test scores at all four universities indicate that critical thinking skills are not promoted enough in tertiary education.

### *Year of Study*

For our research it was important to investigate if the years of exposure to university teaching content contribute to the improvement of students' critical thinking skills. We found that there is a lack of statistically significant differences between GPA and EWCT scores in relation to the year of study. This means that two or three years studying at tertiary education institution did not have a direct influence on the students' critical thinking skills development. Furthermore, it is evident that students' critical thinking skills level from the beginning of their study years was not significantly changed under the influence of foreign language university instruction and it is in line with findings of Parslow (2002) who assumes that critical thinkers are rather born than created. If tertiary education promotes 21st century skills, including critical thinking skills (as it was declared in all four sampled curricula), then it would be expected that students in the third and fourth year of study would achieve better results than their younger colleagues. Furthermore, final year students would have achieved better GPA scores, as critical thinking is in close relation to critical thinking skills improvement (Gadzealla et al., 2004; Hawkins, 2012; Williams et al., 2003 as cited by Liu at al., 2014). In the study by Kermansaravi at al. (2013), the authors reported significant differences between junior, senior, and graduate students. Similar findings were reported by Günaydın and Barlas (2015), as well. The authors found a positive relationship between the year of study and critical thinking skills. Furthermore, the study of Denney (2007) revealed that critical thinking test scores were significantly higher for students who are more educated. When compared with our results, the reviewed research studies have demonstrated that university education plays a very important role in increasing the thinking skills of students.

To conclude, apart from negligible statistical differences in age, there are no statistically significant differences in the measures of critical thinking skills and academic achievement in relation to socio-demographic characteristics of the respondents. Therefore, we may reject our H1 hypothesis. This bears consequences for the further interpretation of results since these variables do not have a connection with critical thinking and academic achievement variables.

## Critical Thinking and Academic Achievement

After rejecting the H1 hypothesis, for the purpose of answering the second research question we further tested the direct relationship between measures of critical thinking and academic achievement, finding a positive moderate correlation between GPA and EWCT test scores, accounting for 16.81 % common variance. It is evident that better critical thinking test score is connected with better academic success, which further means that education system has been, to some extent, successful in recognizing and accurately evaluating critical thinking skills development of students. As concluded above, the lack of correlation between the years of study variable and the level of critical thinking skills indicated that critical thinking has not consequently increased at university. Combined with the fact that CT and GPA scores are in correlation (which is proved in H2), it means that students who already had critical thinking skills capacity, demonstrated this ability in tertiary education context, and that context has recognized and evaluated positively that ability. The relationship between the two variables (critical thinking and academic achievement) has not been sufficiently explored in previous research. As Karbalaei (2012) states, there is an insufficient amount of research that examines if critical thinking increases students' academic performance. Clustering students in the five groups according to their GPA level in our research indicated that there are statistically significant differences in EWCT scores depending on the grade level. Several other researchers also proved similar results concerning the two concepts, including the descriptive-evaluative, descriptive-correlation, and descriptive-comparative study of Baylon (2014, p. 205). The study of EFL student progress in critical thinking measured by the Ennis-Weir Critical Thinking Essay Test showed that skills of critical thinking can be taught to a certain level in the ELT classroom, which can bring benefits to the overall quality of the content that is taught and studied (Davidson and Dunham, 1997, 53). In the study of O'Hare and McGuinness (2009), a modest correlation was discovered between critical thinking and academic performance, lacking, however, other factors that could influence the examined correlation. The author further examined the quality of traditional assessment methods which do not successfully capture all modes of critical thinking that are crucial to tertiary education (p. 129). Rafi (2011) claims that the foreign language learner may become proficient in language use if he/she is motivated enough and instructed to use critical thinking approaches in the foreign language. This means that the foreign language learner must possess the ability to reflect on their production of ideas, and that those ideas should be supported by logical concepts. If foreign language students are given a supportive environment for the production of ideas supported by adequate logical concepts, then their language skills would certainly flourish. Still, in practice we may see that language and thought are taught as separate entities (Yang at al., 2013). As reviewed studies have shown, the relationship between the success in the academic language context and the high scores in CT appraisal are highly interrelated – a finding that this study has confirmed as well.

The identified differences in critical thinking test achievement among the five groups of students, clustered according to their academic achievement, provided in this research more detailed information about the influence of undergraduate programs on the development of critical thinking skills. Data revealed that high achievers are generally located in the GPA–9 and GPA-10 rank, whereas low EWCT test achievers are grouped in the GPA-6 and GPA-7 rank. The presented statistical analyses revealed that foreign language students with the best academic achievement, scored best on the critical thinking skills test. This tendency is explained above by the fact that examined university education systems managed to capture critical thinking

skills of students and awarded their higher-order thinking skills with better grades. Similar results were obtained in the study by Taghva (2014). In this descriptive-correlational research, the results revealed a statistically significant relationship between critical thinking skills and students' academic achievement. Fathi, 2003, King, 1990, as cited in Taghva at al, (2014) proved that CT is a predicting factor of academic achievement. In the study of Ghanizadeh and Mirzaee (2012), the results also indicated the relationship between critical thinking skills and academic achievement, where critical thinking test scores predicted 28% of students' language achievement.

As a conclusion, we declare that there is a statistically significant relationship between EWCT and GPA scores, which means that better academic achievement (expressed in Grade Point Average scores) is achieved by students with higher levels of critical thinking skills (expressed by the Enis-Weir Critical Thinking Test Results). Thus, we accept our H2 hypothesis. To some extent, this claim may help in further research of the assumption of the today's dominant cognitive school model (Soldo, 2017; Slatina, 2005) that enhances students' memorizing-reproductive capacities.

## IMPLICATIONS, LIMITATIONS AND CONCLUSIONS

In practical sense, this research can improve the ongoing educational reform at all levels of education in Bosnia and Herzegovina. Foreign language instructors can benefit from this study by discovering a model of teaching which would help their students go from mere repetition of educational content to acquiring higher-order, critical thinking skills which are important for better academic achievement. One of the advantages of this research in theoretical sense is ensured validity and the reliability of the EWCT test, instrument that measures students' critical thinking knowledge which is not only declarative or accidental (as it is case with others, mainly used standardized critical thinking assessment tools, based on multiple-choice answers).

To ensure better validity of the further research, we need a larger number of participants. Additionally, the number of students at different universities should be approximately the same. As our available stratified sample was not representative, we cannot make conclusions for the whole population. The quality of the research would be increased, and the critical thinking phenomenon would be investigated more deeply if the academic staff, university management staff, and education policy makers were to participate in the research as well. Furthermore, an analysis of course-books would provide more details on the general orientation of the foreign language teaching process and critical thinking development. Another weak point of this study is that we have not addressed the personality traits of students. An analysis of personality traits would provide a large amount of interesting data concerning the relations between critical thinking and academic achievement, including all the other variables that could affect this relationship. We also recommend investigating the critical thinking of preschool, elementary-school and high-school students using more complex research designs, including procedures of structural equation modeling. Together with the results of tertiary education students, a clearer picture of the integration of CT into the school system would be thus obtained.

Based on the results of this research, there is no (statistically proved) relationship between academic achievement and critical thinking by such socio-demographic variables as gender, age, educational level of parents, affiliation with the university and year of study. On the contrary, there is direct positive moderate correlation between critical thinking and academic achievement with medium effect size. Thus, critical thinking is important, at least to some extent, for better academic achievement of English language students in tertiary education at different universities in Bosnia and Herzegovina. More clarification of socio-demographic factors and critical thinking skills relationship is required.

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## Kritičko mišljenje i akademski uspjeh studenata Engleskog jezika

**Sažetak:** Cilj je ovoga rada istražiti povezanost sposobnosti kritičkog mišljenja i akademskog uspjeha studenata Odsjeka za engleski jezik i književnost u odnosu na različite osobne i okolinske faktore. U istraživanju je sudjelovalo 117 studentica i 54 studenta (N=171) prosječne dobi M=20.99 (SD=2.43) s četiri različita univerziteta u Bosni i Hercegovini. Sposobnosti kritičkog mišljenja i sociodemografske karakteristike ispitane su Ennis-Weir testom kritičkog mišljenja (EWCT) i Upitnikom o demografskim podacima. Neparametrijskim statističkim procedurama propitana je povezanost između kritičkog mišljenja i akademskog uspjeha s obzirom na spol, dob, obrazovni nivo roditelja, pripadnosti univerzitetu i godine studija. Nađena je samo jedna statistički značajna, veoma niska, negativna korelacija - između akademskog uspjeha i dobi ispitanika (rs=-.160, p<.05) male veličine efekta, objašnjavajući 2.56% zajedničke varijance. Utvrđena je statistički značajna, pozitivna, umjerena korelacija (rs=.41, p<.001) između EWCT skora i akademskog postignuća srednje jačine efekta (16.81% objašnjene varijance). Nadalje, ustanovljena je statistički značajna razlika između prosječnih EWCT rang skorova klasificiranih prema nivou akademskog postignuća: $\chi2(4)=35.751$, p<.001. Prema ovim rezultatima kritičko mišljenje važno je za akademski uspeh. Daljim istraživanjima treba više razjasniti povezanosti faktora okoline, socio-demografskih varijabli i sposobnosti kritičkog mišljenja.

**Ključne riječi:** akademski uspjeh, kritičko mišljenje, studenti Engleskog jezika, tercijarno obrazovanje

## Kritisches Denken und akademische Leistungen der Studenten des Faches Englisch als Fremdsprache

**Zusammenfassung:** Das Ziel dieser Studie ist es, die Beziehung zwischen der Fähigkeit des kritischen Denkens und den akademischen Leistungen von Englischlernenden in Bezug auf verschiedene persönliche und Umweltfaktoren zu untersuchen. Insgesamt nahmen 117 weibliche und 54 männliche (N= 171) Studenten der Englischen Sprache und Literatur (Alter der M=20.99, SD= 2.43) von vier verschiedenen Universitäten in Bosnien und Herzegowina teil. Die Fähigkeit des kritischen Denkens und sozio-demographische Eigenschaften wurden durch den Ennis-Weir Critical Thinking Essay Test (EWCT) und den Fragebogen zu demografischen Daten untersucht. Nichtparametrische statistische Verfahren wurden verwendet, um die Beziehung zwischen Fähigkeiten des kritischen Denkens und der akademischer Leistungen (Notendurchschnitt) für Geschlecht, Alter, Bildungsniveau der Familie, Universitätszugehörigkeit und Studienjahr zu testen. Die Analyse zeigte nur eine bedeutsame Beziehung zwischen den sozio-demographischen Variablen, dem EWCT und den Notendurchschnittspunkten: sehr schwache negative Korrelation zwischen Alter und Notendurchschnitt ($r_s$=-.160, $p$<.05), mit kleiner Effektgröße, verantwortlich für 2.56% der gemeinsamen Varianz. Eine statistisch bedeutsame positive moderate Korrelation ($r_s$=.41, p<.001) mit mittlere Effektgröße (16.81% Abweichung) zwischen EWCT und Notendurchschnitt wurde festgestellt. Außerdem war der Unterschied zwischen den EWCT mittleren Rangbewertungen mit Notenstufen statistisch bedeutend: $\chi2(4)=35.751$, p<.001. Diesen Resultaten zu Folge, sind Fähigkeiten des kritischen Denkens wichtig für die akademischen Leistungen von Studenten. Zukünftige Forschungen sollten die Beziehung zwischen sozio-demographischen und Umweltfaktoren und Fähigkeiten des kritischen Denkens zu klären versuchen.

**Schlüsselwörter:** akademische Leistungen, Englisch Fremdsprachenlerner, kritisches Denken, tertiäre Bildung